CLAIMS

1. An adaptive signal weighting system including a signal path for transmitting an electrical information signal of a predetermined bandwidth through said system, said system further comprising:

- filter means disposed in said signal path for varying the gain impressed on the portion of said information signal within a first select spectral region within said predetermined bandwidth by a first variable gain factor, said first variable gain factor varying in response to and as a function of a first control signal;
- means, responsive to said information signal, for generating said first control signal in accordance with a frequency value wherein approximately one-half of the energy of said information signal is below said frequency value;
- gain control means disposed in said signal path and coupled to said filter means for varying the signal gain impressed on said information signal substantially throughout said predetermined bandwidth by a second variable gain factor, said second variable gain factor varying in response to and as a function of a second control signal; and
- means for generating said second control signal in response to and as a function of the signal energy of said information signal substantially within a third select spectral region within said predetermined bandwidth.

2. A system according to claim 1 wherein said means for generating said second control signal includes means for detecting the signal energy of said information signal below about 5 KHz.

3. A system according to claim 1, wherein said filter means includes means for varying the first variable gain factor impressed on said portion of said information signal so that said first variable gain factor varies from amplification for signals having relatively high energy within said second select spectral region to attenuation for signals having relatively low energy within said second select spectral region.

4. A system according to claim 1, wherein said filter means includes frequency discrimination means for detecting said portion of said information signal within said first select spectral region and for generating a third signal representative of said portion, and second gain control means coupled to said frequency discrimination means for varying the gain impressed on said third signal in response to and as a function of said first control signal.

5. A system according to claim 4, wherein said frequency discrimination means senses signal energy of said information signal above about 800 Hz.

6. A system according to claim 5, wherein said means for generating said first control signal includes a means for notch filtering and sensing the one-half energy frequency value of said information signal.

7. A system according to claim 1, wherein said means for generating said first control signal includes first detection means for detecting a frequency value wherein about half of the signal energy of said information signal is below said frequency value.

8. A system according to claim 7, wherein said first detection means each includes a variable notch filter that receives and filters said information signal and provides a notch

filtered signal value, wherein said notch filter includes a notch set as a function of said first control signal;

a mixer that receives and mixes said notch filtered signal value and a value indicative of said information signal, and provides a mixed signal indicative thereof; and

an integrator, that integrates said mixed signal, to provide said first control signal.

9. A system according to claim 1, wherein said filter means includes means for varying the first variable gain factor impressed on said portion of said information signal so that said first variable gain factor varies from attenuation for signals having relatively high energy levels within said second select spectral region to amplification of low energy signals having relatively low energy levels within said second select spectral region.

10. An adaptive signal weighting system including a signal path for transmitting an electrical information signal of a predetermined bandwidth through said system, said system further comprising:

- filter means disposed in said signal path for varying the gain impressed on the portion of said information signal within a first select spectral region within said predetermined bandwidth by a first variable gain factor, said first variable gain factor varying in response to and as a function of a first control signal;
- a frequency detection circuit that determines a frequency value wherein approximately one-half of the energy of said information signal is below said frequency value, and generates said first control signal in response to and in accordance with said frequency value wherein

approximately one-half of the energy of said information signal is below said frequency value;

- absolute value of the signal energy of said information signal within a second select spectral region within said predetermined bandwidth including at least a part of said first select spectral region;
- gain control means disposed in said signal path and coupled to said filter means for varying the signal gain impressed on said information signal substantially throughout said predetermined bandwidth by a second variable gain factor, said second variable gain factor varying in response to and as a function of a second control signal; and
- means for generating said second control signal in response to and as a function of the signal energy of said information signal substantially within a third select spectral region within said predetermined bandwidth.

11. A system for decoding an electrical information signal of a predetermined bandwidth previously encoded so that said information signal can be recorded on or transmitted through a dynamically-limited, frequency dependent channel having a dynamically-limited narrower portion in a first spectral region than in at least one other spectral region of said predetermined bandwidth, said system comprising:

- input means for receiving said information signal in its encoded form;
- a signal transmission path coupled to said input means for transmitting said information signal;

- output means coupled to said signal transmission path for providing said information signal in decoded form;
- gain control means disposed in said signal path for varying the signal gain impressed on said information signal substantially throughout said predetermined bandwidth, said signal gain varying in response to and as a function of a first control signal;
- filter means disposed in said signal path and coupled to said gain control means for impressing a second variable gain on the portion of said information signal substantially within said first spectral region so as to deemphasize said portion with respect to the remaining portions of said information signal, said second variable gain varying in response to and as a function of a second control signal;
- means for generating said first control signal in response to and as a function of the signal energy of said information signal within a second spectral region of said information signal; and
- means for generating said second control signal in accordance with a frequency value wherein approximately one-half of the energy of said information signal is below said frequency value.

12. A system according to claim 11, wherein said means for generating said second control signal includes

a variable notch filter that receives and filters said information signal and provides a notch filtered signal value, wherein said notch filter includes a notch set as a function of said first control

signal;

a mixer that receives and mixes said notch filtered signal value and a value indicative of said information signal, and provides a mixed signal indicative thereof; and

an integrator, that integrates said mixed signal, to provide said second control signal.

13. A system according to claim 11, wherein said means for generating said second control signal includes

a low pass filter that filters said information signal to provide a first filtered signal;

a first absolute value detector that receives said first filtered signal and provides a first absolute filtered signal indicative thereof;

an amplifier that amplifies said first absolute value signal to provide an amplified first absolute filtered signal indicative thereof;

a second absolute value detector that receives said information signal and provides a second absolute filtered signal indicative thereof;

a comparator that compares said amplified first absolute filtered signal and said second absolute filtered signal that provides a control signal; and

means, responsive to said control signal, for generating said second control signal.

14. A system according to claim 11, wherein said means for generating said first control signal includes first detection means for detecting said signal energy of said information signal within a second spectral region that includes about one-half of the energy of said information signal.

15. A system according to claim 14, wherein said first detection means includes means for generating a D.C. signal as a function of the corresponding signal energy detected.

16. A system according to claim 15, wherein said means for generating a D.C. signal includes an RMS detector.

17. A system according to claim 16, wherein said first and second gain control means each comprise a voltage control amplifier.

18. A system according to claim 17, wherein each of said amplifiers is set for signal expansion at substantially the same expansion ratio.

19. A system according to claim 18, wherein said expansion ratio is 1:2.